

Application No. 10/772,102

REMARKS

Claims 1-14 and 16-26 are pending. By this Amendment, claim 15 is cancelled, claims 1 and 18 are amended, and new claims 21-26 are added. The specification is amended to incorporate the feature of claim 7 as filed into the specification and to fix an obvious typographical error. Specifically, the Examiner objected to the disclosure on page 22, line 5, asserting that the "the second temperature should be 400, not 500." Applicant has corrected the specification as suggested by the Examiner. The amendment to claim 1 is supported by the specification at, for example, page 24, line 30 to page 25, line 2. The Amendment to claim 18 is supported by the specification at, for example, page 22, lines 12-18.

New claim 21 is supported by the specification, for example, at page 22, lines 12-18. New claim 22 is supported by the specification, for example, at page 23, lines 25-31. New claim 23 is supported by the specification, for example, at page 23, lines 11-24. New claim 24 is supported by the specification, for example, at page 24, lines 11-13. New claims 25 and 26 are supported by the specification, for example, at page 24, lines 22-26. No new matter is introduced by the amendments or the new claims.

All of the pending claims stand rejected. Applicants respectfully request reconsideration of the rejections based upon the following comments.

Double Patenting

The Examiner rejected claims 1, 3, 4, 8, 9, and 11 under the judicially created doctrine of obvious-type double patenting as being unpatentable over claims 25, 29, 30, 32 and 33 of U.S. Patent 6,749,648. Applicants have incorporated the features of claim 15 into independent claim 1. Applicants note that the Examiner did not reject claims 15 over claims 25, 29, 30 and 32 of U.S. Patent 6,749,648. Thus, Applicants believe that the rejection is avoided. Applicants respectfully request withdrawal of the rejection of claims 1, 3, 4, 8, 9 and 11 under the judicially

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created doctrine of obvious-type double patenting as being unpatentable over claims 25, 29, 30, 32 and 33 of U.S. Patent 6,749,648.

Rejections Under 35 U.S.C. § 112, First Paragraph

The Examiner rejected claim 7 under 35 U.S.C. § 112, first paragraph, asserting that the claim "contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention." Additionally, the Examiner noted that, "Applicant can insert the claimed subject matter into the specification to overcome the rejection." Applicant has inserted the claimed subject matter into the specification, and respectfully requests the withdrawal of the rejection of claim 7 under 35 U.S.C. § 112, first paragraph. Applicants thank the Examiner for a careful reading of the application.

Rejections Under 35 U.S.C. § 102 of Claim 1 and Claims Depending from Claim 1

The Examiner rejected claims 1, 2, and 10 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 4,548,798. The Examiner also rejected claims 1, 2, 10 and 11 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent 6,254,928. Additionally, the Examiner rejected claims 1, 2, 10, 11, 13 and 14 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent 6,099,798, and rejected claims 1, 2, 10, 11, 13 and 14 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent 6,290,735. The Examiner also rejected claims 1-6, 8, 9, 11 and 14 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent 6,749,648.

However, the Examiner also indicated that "claim 15 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claim." Applicant has incorporated all of the features of claim 15 into independent claim 1, and thus the rejections of independent claim 1,

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and the claims that depend directly or indirectly from claim 1, under 35 U.S.C. § 102(b) and 35 U.S.C. § 102(e) are moot. Applicant respectfully request the withdrawal of the rejections of claims 1-6, 8-11, 13, and 14 under 35 U.S.C. § 102(b) and 35 U.S.C. § 102(e).

Rejection Over Van der Wal et al.

Additionally, the Examiner rejected claim 16 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 4,478,800 to van der Wal et al. More specifically, the Examiner asserted that the '800 Patent "teaches forming metal sulfides by reacting metal oxides with H₂S at a temperature of 200-700°C, where the metal oxides have a particle size of less than 40 nm." However, Applicants believe that there has been a misunderstanding with respect to the disclosure of the '800 patent. Applicants' maintain that the '800 patent does not prima facie anticipate Applicants' claimed invention. Applicants respectfully request reconsideration of the rejection based on the following comments.

The '800 patent describes the formation of the metal oxide "particles" in contact with a support surface. See, for example, column 4, lines 10-12, 47-60. The "particles" are clearly bound to the surface. For example, the materials are contrasted with the use of larger particles that can rupture during the reaction to release fine particles into the gas flow. See column 4, 62-68. Since the particles in the '800 patent are not carried away in the gas flow, they are bound to the support. See also Methods A-C columns 7-8 with respect to formation of the metal oxides in contact with the support. Therefore, the "particles" are actually nanostructures coatings on a support surface. The '800 patent does not disclose physical particles as disclosed and claimed by Applicants. Since the '800 patent does not teach nanoscale physical particles, the '800 patent does not prima facie anticipate Applicants' claimed invention. Applicants respectfully request withdrawal of the rejection of claim 16 under 35 U.S.C. § 102(b) as being anticipated by the '800 patent.

Rejection Over Espin et al.

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The Examiner rejected claims 16 and 17 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent 6,447,577. The Examiner also asserted that the '577 Patent "teaches forming metal sulfides by reacting metal oxides with H₂S at a temperature of 40 or 120°C, where the metal oxides have a particle size is a most 100 nm." With all due respect, Applicants believe that there has been a misunderstanding with respect to the nature of the materials disclosed in the '577 patent. Applicants maintain that the '577 patent does not prima facie anticipate Applicants' claimed invention. Applicant respectfully requests reconsideration of the rejection based upon the following comments.

As with the '800 patent above, the "particles" on a substrate are placed in a gas stream. See, for example, column 3, lines 8-12. The "particles" are asserted to be extremely small (100 atoms). See, column 3, lines 1-3. The "particles" are clearly nanostructured materials bound to the substrate surface. The '577 patent refers to three patents by Klabunde et al. at column 2, lines 47-49 with respect to the production of the particles. U.S. patents 6,087,294, 5,759,939 and 4,877,647 make it clear that the materials are nanocrystalline coatings on a substrate surface. Since the '577 does not teach physical particles with the claimed properties, the '577 patent does not prima facie anticipate Applicants' claimed invention. Applicants respectfully request withdrawal of the rejection of claims 16 and 17 under 35 U.S.C. § 102(e) as being anticipated by the '577 patent.

Rejection Of Claims 8 and 12 Under 35 U.S.C. § 103(a)

The Examiner rejected claims 8 and 12 under 35 U.S.C. § 103(a) as being obvious over U.S. Patent 6,099,798 in view of U.S. Patent 6,589,496. Claims 8 and 12 each depend directly from claim 1 and therefore incorporate all of the features of claim 1. As discussed above, claim 1 now incorporates all the features of claim 15, which the Examiner indicated was allowable subject matter. Therefore, since claim 1 is not obvious over U.S. Patent 6,099,798 in view of U.S. Patent 6,589,496, then claims 8 and 12, which depend directly from claim 1, are not made

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obvious by the combination of the '798 Patent and the '496 Patent. Applicant respectfully requests the withdrawal of the rejection of claims 8 and 12 as being obvious over U.S. Patent 6,099,798 in view of U.S. Patent 6,589,496.

Rejection of Claim 17 Over the '800 Patent

The Examiner rejected claim 17 under 35 U.S.C. § 103(a) as being unpatentable over the '800 Patent. As noted above, the '800 patent is directed to nanostructured coatings and does not teach physical particles with the claimed properties. Since the '800 Patent does not disclose or suggest all of features of Applicant's invention, as claimed in independent claim 16, the '800 Patent does not render claim 17, which depends from claim 16, prima facie obvious. Since the '800 Patent does not render claim 17 prima facie obvious, Applicant respectfully requests the withdrawal of the rejection of claim 17 as being unpatentable over the '800 Patent.

Rejection Over Gray et al.

The Examiner rejected claims 18-20 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 6,090,200 to Gray et al. More specifically, the Examiner asserted that the '200 Patent discloses "nanosized metal sulfide phosphor particles. The phosphors have a particle size in the range of 1-30 nm, which means the average size in this range." With all due respect, Applicants do not believe that this assertion with respect to the average particle size is accurate. Specifically, referring to column 3, lines 10-13, the '200 patent indicates that the mesopore cavities have a range from about 2 nm to about 30 nm, but "more often about 2.5 nm to about 10 nm. This implies that the distribution from 2 to 30 nm is peaked between 2.5 nm and 10 nm and not at 15 nm or more. This would indicate an average particle size less than 10 nm. Since the average particle size does not overlap with the claimed particle size, the '200 patent does not render Applicants' claimed invention prima facie obvious. Since the '200 patent does not render Applicants' claimed invention prima facie obvious, Applicant respectfully requests the

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withdrawal of the rejection of claim 18-20 under 35 U.S.C. § 103(a) as being unpatentable over the '200 Patent.

Rejection Over Hampden-Smith et al

The Examiner also rejected claims 18 and 20 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 6,153,123 to Hampden-Smith et al. More specifically, the Examiner asserted that the '123 Patent teaches "metal sulfide phosphors having an average particle size in the range of 0.3-3 microns, which overlaps the claimed range." As presently claimed, Applicant's invention relates to a collection of rare earth doped metal/metalloid sulfide particles having an average particle size from about 15 nm to about 250 nm. Since the '123 Patent does not disclose or suggest all of the features of Applicant's invention, as presently claimed in independent claim 18, the '123 Patent does not render Applicant's invention prima facie obvious. Therefore, Applicant respectfully requests withdrawal of the rejection of claims 18 and 20 under 35 U.S.C. § 103(a) as being unpatentable over the '123 Patent.

Rejection Over Rimen et al.

The Examiner also rejected claims 18 and 20 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 6,699,406 to Rimen et al. More specifically, the Examiner asserted that the '406 Patent discloses "rare earth doped metal chalcogenide phosphor nanoparticles. The amount of rare earth dopant is up to 60 mol%, which overlaps the claimed range. The particles have a size in the range of 1-100 nm, which overlaps the claimed range." However, Applicants submit that the '406 patent describes crystallite sizes. Specifically, with respect to column 5, lines 59-63, the '406 patent describes "crystallite size" and not particle size. Thus, the "particle" sizes disclosed in the '406 Patent relates to the crystallite size and not to the size of individual nanoparticles. In contrast, Applicant's invention, as claimed in claim 18 and described in the specification, relates to a collection of rare earth doped metal/metalloid sulfide particles having an average particle size from about 15 nm to about 250 nm. Since the '406 Patent does not

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disclose or suggest all of the features of Applicant's invention, as claimed in independent claim 18, the '406 Patent does not render Applicant's invention prima facie obvious. Therefore, Applicant respectfully requests the withdrawal of the rejection of claim 18 and 20 under 35 U.S.C. § 103(a) as being unpatentable over the '406 Patent.

Applicant does not comment further on specific features of the dependent claims, although the Applicant does not acquiesce in the assertions of the office action, since these issues are presently moot in view of the above analysis. Applicants respectfully request the withdrawal of the rejections under 35 U.S.C. § 103(a).

CONCLUSION

In view of the foregoing, it is submitted that this application is in condition for allowance. Favorable consideration and prompt allowance of the application are respectfully requested.

The Examiner is invited to telephone the undersigned if the Examiner believes it would be useful to advance prosecution.

Respectfully submitted,



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